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Technical Report 706

**The 1984 and 1985 ARI Survey of Army Recruits:
Methodology and Recommendations
for Future Administrations**

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Research Institute for the Behavioral and Social Sciences

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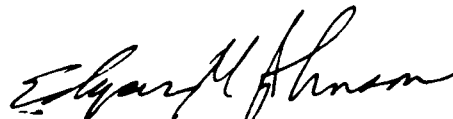
FOREWORD

The ARI Surveys of Army Recruits, familiarly known as New Recruit Surveys, have become an important source of information for Army policymakers and planners. These surveys were originally designed in 1982 to answer questions concerning the demographics and enlistment motivations of new Army recruits. In addition to the ability to track changes in recruits from year to year, this series of surveys offers the Army an opportunity to gather new information in each year of the survey.

The 1982 and 1983 Surveys were directly commissioned by the Deputy Chief of Staff for Personnel. The 1984 and 1985 Surveys were sponsored by the U.S. Army Recruiting Command and were undertaken with the continuing interest of the Office of the Deputy Chief of Staff for Personnel. While the sponsorship, specific questions, and interests may change year to year, the charter for these surveys remains the same:

- Determine who is enlisting in the Army and why.
- Determine how to target recruiting resources to attract high quality recruits.
- Determine why recent recruits joined and their propensity to remain in the service.
- Determine which recruiting and advertising practices are proving the most successful and why.

In addition to addressing these specific objectives, this survey effort expands the availability of data to model Army enlistment and reenlistment processes.



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THE 1984 AND 1985 ARI SURVEY OF ARMY RECRUITS:
METHODOLOGY AND RECOMMENDATIONS FOR FUTURE ADMINISTRATIONS

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The project was sponsored by the Directorate of Program Analysis and Evaluation, U.S. Army Recruiting Command, Office of the Deputy Chief of Staff for Personnel. The U.S. Army Recruiting Command Provided funding for the database preparation and tabular descriptions produced under Contract No. MDA903-84-C-0446, expiring 30 September 1986. Westat, Inc. has been the contractor for this effort with Veronica Nieva and Jeanna Celeste Service, respectively, as Principal Investigator and Project Director.

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The U.S. Army Research Institute provided funding and personnel for research planning, survey design and administration, as well as personnel for the technical monitoring of the contract and construction of the databases.

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THE 1984 AND 1985 ARI SURVEY OF ARMY RECRUITS:
METHODOLOGY AND RECOMMENDATIONS FOR FUTURE ADMINISTRATIONS

EXECUTIVE SUMMARY

Requirement:

New Recruit Surveys provide information to Army personnel planners regarding the characteristics, knowledge of enlistment options, and enlistment motivations of new recruits. It is necessary to examine the methodologies employed in recent years (1984 and 1985) to develop an understanding of the strengths and weaknesses of each. In this way, future efforts can take advantage of the experience of previous NRS administrations.

Procedures:

The 1984 Summer and Fall/Winter New Recruit Survey (NRS) were, respectively, the fourth and fifth in a series of recruit surveys administered by ARI. Data were collected by ARI in group settings during initial recruit processing at all eight Army Reception Stations during June, July, August, and October of 1984, as well as February 1985. Reception Station personnel were responsible for scheduling and supervising survey administration, guided by instructions prepared by ARI. The NRS was self-administered and recruits were directed to indicate their responses on optical scanning forms.

The sixth administration of the NRS was conducted in the summer of 1985. The 1985 NRS differed from previous survey efforts in several major ways: a sampling plan was developed which distributed administrations across the summer weeks and Reception Stations; Westat research personnel supervised the survey administrations on-site; and sample pools of respondents were monitored and nonrespondents rescheduled for the survey.

The 1984 NRS administration was compared with the 1985 NRS in terms of instrument design, data collection, and data preparation procedures. Within each topic area, the procedures of the 1984 and 1985 surveys are briefly reviewed followed by a discussion of the lessons learned and advantages/disadvantages of each. Based upon the lessons learned, recommendations are made for the conduct of future surveys.

Results

A number of recommendations were proposed for future administrations of the NRS:

- The survey instrument revision process should be formalized;
- The use of separate answer sheets should be discontinued;
- NRS administration schedules and personnel responsibilities should be clearly established and maintained; and,
- Actual administration of the NRS should be supervised by research personnel, not Reception Station personnel.

Utilization

Design of the Summer 1986 New Recruit Survey (NRS) benefited from the lessons learned in the 1984 and 1985 NRS. As recommended in this report, plans are being made to formalize the survey instrument revision process in the 1987 NRS. The lessons learned and recommendations offered in this report provide useful input for the development of the implementation plan for the U.S. Army Recruiting Command's institutionalization of the New Recruit Survey.

THE 1984 AND 1985 ARI SURVEY OF ARMY RECRUITS:
METHODOLOGY AND RECOMMENDATIONS FOR FUTURE ADMINISTRATIONS

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THE 1984 AND 1985 ARI SURVEY OF ARMY RECRUITS:
METHODOLOGY AND RECOMMENDATIONS FOR FUTURE ADMINISTRATIONS

INTRODUCTION

The purpose of this report is to overview and compare the methodologies employed in the 1984 (Summer and Fall/Winter) and 1985 (Summer) administrations of the U.S. Army Research Institute Survey of New Recruits, present lessons learned from these administrations, and provide recommendations for future survey efforts. This first chapter introduces other reports produced to document the 1984 and 1985 surveys, discusses the organization of this final report, and reviews the background of the 1984 and 1985 NRS. The remaining report chapters present: (1) lessons learned from the two administrations, drawing comparisons between the methodologies employed, and (2) recommendations for future surveys. It should be noted that the 1984 Summer and Fall/Winter administrations are treated together, i.e., the 1984 NRS, when compared to the 1985 NRS. This approach was taken because the same survey instruments were used in the 1984 Summer and 1984 Fall/Winter, and the survey methodology employed in both administrations of the 1984 NRS were nearly identical.

NRS Reports

This task final report is one in a series of 20 reports produced to document the approach, data, and results obtained from the 1984 and 1985 NRS. (Other reports have been produced documenting the 1982 and 1983 NRS.) As the final report, this document overviews and compares the survey methodologies used in the 1984 and 1985 NRS, including instrument design, data collection, data preparation, data processing techniques, and survey documentation employed; it also proposes recommendations for future surveys. The recommendations address problems inherent in performing ad hoc surveys and contrast survey outcomes using different implementation strategies.

In order to fully understand the lessons learned and recommendations presented in this report, readers are advised to examine the three User's Manuals developed, respectively, for the two 1984 and the Summer 1985 administrations of the NRS. The User's Manuals document the survey methodology and focus on providing background information for survey data users. The Summer and Winter administrations of the 1984 NRS used the same administration procedures and identical versions of the survey instrument, so that only a supplemental User's Manual was required for the Winter administration. As the name implies, the Supplementary User's Manual provides specific information about the Winter 1984 NRS that complements the more complete 1984 User's Manual.

The User's Manuals provide information about the development and content of the NRS instruments and survey approaches taken in the 1984 and 1985 NRS administrations. Citations for these three reports are as follows:

- The 1984 ARI Survey of Army Recruits: User's Manual (Research Note 86-46). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1984 ARI Survey of Army Recruits: Supplementary User's Manual for October 84/February 85 Administration (Research Note 86-47). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1985 ARI Survey of Army Recruits: User's Manual (Research Note 86-50). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.

Other reports in the 1984 and 1985 NRS series are structured to present survey results, data documentation, and survey methodology. Codebooks have been produced to document the physical locations and labels for all variables produced on the SAS and OS survey data files produced for the 1984 and 1985 NRS. Each of the six codebooks pertains to a particular Army service component and NRS administration:

- The 1984 ARI Survey of Army Recruits: Codebook for Summer 84 Active Army Survey Respondents (Research Note 86-42). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1984 ARI Survey of Army Recruits: Codebook for Summer 84 USAR & ARNG Survey Respondents (Research Note 86-43). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1984 ARI Survey of Army Recruits: Codebook for October 84/February 85 Active Army Survey Respondents (Research Note 86-44). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1984 ARI Survey of Army Recruits: Codebook for October 84/February 85 USAR & ARNG Survey Respondents (Research Note 86-45). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.

- The 1985 ARI Survey of Army Recruits: Codebook for Summer 85 Active Army Survey Respondents (Research Note 86-48). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1985 ARI Survey of Army Recruits: Codebook for Summer 85 USAR & ARNG Survey Respondents (Research Note 86-49). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.

Preliminary results for the 1984 and 1985 NRS surveys are reported in separate documents containing crosstabulations of the NRS items by selected respondent demographics and service-related characteristics. The tabulations produced for the Summer 1984 and 1985 NRS are listed below:

- The 1984 ARI Survey of Army Recruits: Tabular Description of NPS (Active) Army Accessions, Volumes 1 and 2 (Research Products 86-09 and 86-10). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1984 ARI Survey of Army Recruits: Tabular Description of NPS Army National Guard Accessions (Research Product 86-11). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1984 ARI Survey of Army Recruits: Tabular Description of NPS Army Reserve Accessions, Volumes 1 and 2 (Research Products 86-12 and 86-13). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1985 ARI Survey of Army Recruits: Tabular Description of NPS (Active) Army Accessions, Volumes 1 and 2 (Research Products 86-14 and 86-15). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1985 ARI Survey of Army Recruits: Tabular Description of Army National Guard Accessions (Research Product 86-16). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.
- The 1985 ARI Survey of Army Recruits: Tabular Description of NPS Army Reserve Accessions, Volumes 1 and 2 (Research Products 86-17 and 86-18). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.

No comparable volumes were produced for the October 84/February 85 survey administrations. The same crossing variables and recoded survey items produced for the 1984 Summer database were also constructed for the Winter, thus allowing data analysts to produce tables comparable to the other tabulation volumes using 1984 Winter data.

Organization of the Final Report

This final report is organized into three chapters. The first introduces the report within the context of the twenty-volume series of reports produced to document the 1984 Summer, 1984 Winter, and 1985 Summer administrations of the NRS and discusses the structure of the report as well. The first chapter ends with an overview of the 1984 and 1985 NRS administrations.

The second chapter in the final report reviews the survey methodologies employed in the 1984 and 1985 NRS, drawing comparisons of the instrument design, data collection, data preparation and processing techniques, and survey documentation. The advantages and disadvantages of each approach are discussed, and "lessons learned" from these administrations are presented.

The third and final chapter of the report discusses problems with performing ad hoc surveys. The chapter also focuses on the implications of administration procedures for data quality and sample representativeness. Recommendations for future surveys are proposed.

Project Overview

The Army Research Institute (ARI) Surveys of Army Recruits, commonly known as the ARI New Recruit Surveys (NRS), are conducted on a regular basis to provide updated information on the characteristics, knowledge of enlistment options, and enlistment motivations of recruits at the point of their initial entry into service. Military personnel planners require such information on a regular basis to monitor current recruiting strategies and to forecast future enlistment trends.

The NRS were begun in the spring of 1982. Expanded versions of the 1982 surveys were administered in the Summer of 1983 and Winter of 1984. Further revisions and expansions were made to the 1984 instruments for administration in the Summer of 1984 and Fall/Winter of FY 85. The NRS was further expanded for the Summer 1985 administration. In addition to the ability to track changes in recruits from year to year, this series of surveys offers the Army an opportunity to gather new information in each year of the survey.

The 1982 and 1983 surveys were directly commissioned by the Deputy Chief of Staff for Personnel. The 1984 and 1985 NRS were sponsored by the U.S. Army Recruiting Command and were undertaken with the continuing interest of the Deputy Chief of Staff for Personnel. While the sponsorship, specific questions, and interests may change from year to year, the charter for these surveys remains the same. The four main research requirements have been to determine: (1) the demographic composition of entering recruits; (2) how to target recruiting resources to attract high quality recruits; (3) new recruits' enlistment motivations and propensity for remaining in service; and (4) which recruiting and advertising practices are proving the most successful and why.

The 1984 Summer and Fall/Winter NRS are, respectively, the fourth and fifth administrations in the series of recruit surveys conducted by ARI. Identical versions of the NRS instruments were administered to recruits in the two administrations. The 1984 survey was an expanded version of previous NRS. No formal sampling plan was implemented for the 1984 NRS, however, it was expected that all recruits being processed for initial entry training during the administration period would be surveyed by the Reception Stations. Survey data were collected in group settings during initial recruit processing at all eight Army Reception Stations during June-August, 1984, and again in October 1984 and February 1985. Reception station personnel were responsible for scheduling and supervising survey administration, guided by instructions prepared by ARI. The NRS was self-administered and recruits were directed to indicate their responses on optical scanning forms.

The sixth administration of the NRS was conducted in the Summer of 1985, and reflected numerous changes in both the design of the instrument and survey administration procedures. As in previous years, this version of the NRS incorporated the revision of certain questions and the addition of others to reflect changes in both personnel planning concerns and the recruiting environment. New questions in this instrument tended to focus on experiences and influences occurring before entry into the Army, to allow assessment of their effect on enlistment decision making. One major change in the 1985 NRS instrument was that respondents answered survey items directly on the instrument. All previous NRS surveys used separate optical scanning answer sheets.

The Summer 1985 NRS administration differed from previous survey efforts in several important ways. First, the 1985 NRS used a sampling plan to allocate administrations evenly throughout the survey period. Two Reception Stations were surveyed during each of the twelve administration weeks, during the months of June-September, 1985. Second, Reception Station personnel were not responsible for survey administration. On-site supervision and administration of the NRS was the responsibility of

research personnel from Westat, Inc. Third, lists were maintained of recruits beginning initial processing at each of the eight Reception Stations. In order to achieve high response rates, efforts were made to keep track of and reschedule new recruits who failed to complete a survey form.

During both the 1984 and 1985 NRS, four forms of the NRS were administered to new recruits. Forms A, B, and C were administered to Regular Army recruits, and Form D was given to National Guard and Army Reserve recruits. Regular Army recruits had an equal chance of receiving any one of the three forms.

A total of 15,309 Army recruits completed the 1984 NRS. During the Summer administration, 10,495 of these recruits were surveyed, while 4,814 recruits completed surveys during the Fall/Winter 1984 NRS. The 1985 NRS surveyed a total of 12,536 Army recruits. The surveys were distributed across components and administrations as follows:

<u>NRS</u>	<u>Regular Army</u>	<u>Army Reserve/National Guard</u>
Summer 1984	6,184	4,311
Winter 1984	3,524	1,290
Summer 1985	7,220	5,316

The 1984 NRS answer sheets were optically scanned. The 1985 survey responses were reviewed by a coding staff and prepared for data entry. Care was taken in both instances to record responses exactly as marked. Survey data were then edited for value ranges and logical consistency. User's manuals, codebooks, and tabulation volumes were produced.

The sampling plans employed impose some restrictions on the generalizability of survey results to the populations of Army accessions during FY 84 and FY 85. However, overall, these survey efforts were successful in obtaining updated information regarding new recruits.

The 1984 and 1985 ARI Surveys of Army Recruits provide information to Army personnel planners about the quantity and quality of recruits entering the Army. In particular, information regarding the characteristics, knowledge of enlistment options, and enlistment motivations of new recruits enables Army personnel planners to be cognizant of present enlistment trends. Awareness of these trends is vital, in turn, for preparing for future manpower requirements.

LESSONS LEARNED

This chapter reviews and compares the NRS 1984 and 1985 administrations. Details of administration and specific lessons learned in each administration are documented more fully in the separate User's Manuals for 1984 (Research Notes 86-46 and 86-47) and 1985 (Research Note 86-50). This chapter focuses on what can be learned from differences in outcomes resulting from differences in survey procedures. There are three main areas of survey administration covered in this discussion: (1) instrument design, (2) survey administration and data collection, and (3) data preparation and processing. Each of these areas is covered in a separate subsection in this chapter.

Instrument Design

In many respects, the 1984 and 1985 NRS instruments are very similar. Both can be considered refinements and expansions of earlier NRS instruments. The content of the instruments designed in each year covered similar topics. Both the 1984 and 1985 NRS used multiple forms: three versions of the RA instrument, and a combined survey form for the USAR and ARNG. There was a similar focus in both years on obtaining responses from non-prior service recruits and not exceeding a time limitation of one hour for survey completion.

One major difference in the survey instruments employed in each of the two years was that the 1984 NRS was designed for use with an OPSCAN answer sheet and the 1985 was formatted for entry of responses directly on the instrument. This difference in questionnaire format had implications for the types and structures of questions that could be included in each instrument. In addition, differences in the 1984 and 1985 survey formats led to considerable differences in data handling procedures, which will be discussed later in this chapter.

The use of OPSCAN answer sheets placed a number of restrictions on the design of the 1984 instruments. The number of questions that could be included on each questionnaire was limited to the number of lines available on the answer sheets. Skip patterns were not able to be used in the instrument since respondents can easily lose their place on the questionnaire while writing down answers on a separate answer sheet. This meant that questions which were inappropriate for certain classes of respondents had to include response categories that indicated the question's inapplicability for these individuals. This probably contributed to the frustration of respondents who were forced to read all questions even when they were inappropriate. Another problem encountered was that questions requiring multiple responses, e.g., "mark all (response categories) that apply"

formatted questions, needed special instructions for respondents to input all answers in the same answer slot. This was counter to the typical procedure of recording a single response in a given line on the answer sheet. It is unknown how many respondents became confused and used several answer lines to fill in responses to a single multiple-part question.

The use of survey instruments that allowed the recording of responses directly on the form in the 1985 NRS, provided more flexibility than the use of both a questionnaire and separate answer sheet. The switch to this format enabled the inclusion of open-ended questions requesting both short and long written responses. This was a considerable advantage in terms of obtaining dollar figures, dates, the names of schools attended, courses of study and so on. In addition, this format made it possible to explore new topic areas with respondents without the necessity of conducting qualitative interviews. Analysts can study answers to the open-ended questions and obtain a better understanding of the perspectives of new recruits on a variety of previously unexplored subjects and obtain a more in-depth view of the rationale behind recruits' answers to related pre-coded questions. Because answers were recorded on the same page as the printed questions, multiple response questions were easily completed. Skip patterns were incorporated in the 1985 NRS instruments to eliminate the need for respondents to read questions that were obviously inappropriate, given their answers to previous questions. This avoided the problem of having respondents read through inapplicable questions and their answer categories in an attempt to find a response indicating that the question was inappropriate. The use of skip patterns should have aided in lowering respondents' frustration levels and thus response error rates. The number of questions that could be asked in the 1985 NRS was not limited by the use of a separate answer sheet as it had been in the 1984 NRS. The only limitation on the number of questions that could be included in the 1985 NRS was the requirement that the survey not take longer than 60 minutes to complete. Thus, the inclusion of a large number of questions that required minimal time to answer posed no particular problem for the 1985 NRS.

Although many useful formatting techniques were incorporated to facilitate survey completion by respondents, there were still some problems associated with the instrumentation of the 1985 NRS. There was minimal time allotted for questionnaire design and review and no arrangements for a pretest. This led to the need for instrument revisions during the first week of survey fielding. Instruments were pulled out of printing production for last minute question additions and response category revisions. This resulted in difficulties during the data preparation stage because special missing value codes had to be devised to identify cases in which the new questions did not appear and in which new response categories were not present. Selected coders were trained to handle the early versions of the survey instruments.

This special handling was necessary in order to avoid developing separate formats for data entry (see the 1985 User's Manual, Research Note 86-50).

A pretest would have helped to identify additional problems encountered by respondents in the 1985 NRS. For example, it was discovered that respondents generally had difficulty in recording the dollar amounts that accrued with various educational incentives, in terms of both their own contribution amounts as well as contribution amounts from the government. Also, respondents who were surveyed early in their in-processing were less likely to accurately recall information regarding enlistment incentives than respondents who were nearing the end of their processing at the Reception Stations. This is likely due to the fact that the Reception Stations provide both general discussions regarding Army enlistment incentives as well as individual-specific discussions about incentives eligibility near the end of initial processing. Thus, it is important to have respondents record the day of Reception Station processing they are in at the time of survey administration. This will enable analysts to examine differences in the knowledge levels and attitudes of recruits in various stages of in-processing.

Survey Administration and Data Collection

1984 NRS. It is somewhat difficult to contrast the actual survey administration procedures used in the 1984 with those employed for the 1985 NRS because the former was conducted by personnel at each of the eight Reception Stations guided by instructions prepared by ARI (see Appendix E in the 1984 User's Manual, Research Note 86-46). The instructions prepared by ARI covered activities pertaining to three main phases of the NRS: (1) pre-administration preparation, (2) administration procedures, and (3) preparation for subsequent groups. Pre-administration preparation instructions requested that the survey administrators familiarize themselves with the survey booklets and contact ARI personnel to resolve any difficulties. In addition, administrators were asked to make available adequate seats and table space, as well as pencils with #2 lead for each survey administration. Administrators were asked to display the survey date and site number for respondents, to ensure that respondents brought processing forms-containing their social security numbers to the survey, and to distribute answer sheets, survey booklets, and pencils prior to seating recruits for the NRS.

ARI instructions regarding survey administration procedures requested that survey administrators check to be sure that recruits filled out the survey forms appropriate to their component, read the Privacy Act of 1973 and ARI assurances of confidentiality, and read instructions pertinent to the use of

optical scan answer sheets. Survey administrators were then asked to read aloud to recruits instructions for completing the background section of the survey (e.g., fill in social security numbers, sex, survey date, and so on) and to read final instructions regarding skipping questions, time allotted for completing the survey, and how to turn in materials at the end of the administration. Survey proctors were requested to remain in the room with respondents throughout the survey, attend to individual questions by going to the recruit's seat, and to thank each soldier for completing the survey as they turned in their materials.

Post-administration procedures included review of each instrument for marking, discarding those which had written comments, separating the USAR/ARNG forms from the three RA surveys, and interleaving Forms A, B, and C in a systematic way (i.e., A,B,C,A,B,C).

Administration procedures varied somewhat at each of the eight Reception Stations as Personnel Affairs administered the NRS-84 at some installations and at others the Testing Branch handled the survey procedures. Examination of Table 3 in the 1984 User's Manual (Research Note 86-46) and Table 2 in the October 84/February 85 Supplementary User's Manual (Research Note 86-47) reveal that administration schedules were not followed uniformly across installations. ARI had requested that the NRS-84 survey administrations be carried out during the weeks of 25 June, 16 July, and 6 August, 1984 for the summer administrations, and during the weeks of 29 October, 1984 and 18 February, 1985. In fact, some Reception Stations administered the NRS-84 during weeks prior to and others later than those assigned, some installations administered the surveys across two different weeks, and others failed entirely to administer the survey during the assigned months. The differences in the administration schedules were fairly easy to detect, other differences in the administration procedures may have been more subtle and less easy to identify. For example, it is not known how closely Reception Station personnel followed the set of instructions prepared for them by ARI. It is likely that other conditions of survey administration differed across installations. Perhaps some administrators failed to familiarize themselves with the survey instruments and were thus unable to answer questions as they arose in the survey sessions; at other installations, survey administrators probably gave their own interpretation of what specific survey items were asking. Some Reception Stations probably had sergeants or officers in attendance at the survey administration to maintain order and no uniformed personnel present at others. This may not necessarily affect survey results unless respondents perceived the uniformed personnel to be "watching over" the answers they were providing.

A major difficulty in having Reception Station personnel administer the NRS is that there is little or no documentation produced that will allow researchers to know what problems came up, if any, and how they were handled. The main reference source that was maintained by installation personnel was the log-in sheets. These sheets indicated how many recruits were each day's processing load, the number surveyed, the number declining to take the survey, and the number not surveyed for other reasons. Had this information been faithfully and accurately provided by all survey administrators, this would have provided the information that was needed to calculate response rates for each Reception Station. Unfortunately, these forms were not completed uniformly nor completely for the various administrations of the 1984 NRS.

1985 NRS. In the spring of 1985, ARI sent letters of introduction regarding the upcoming NRS and requested a point of contact (POC) at each Reception Station. This initial letter indicated that Westat research staff would be conducting the administration of the summer 1985 NRS. Westat staff contacted Reception Station POC's to set up survey arrangements and to inform them of the administration schedule. At the first visit, an ARI staff member accompanied the Westat survey administrator to the installation and provided the POC and other interested parties with an in-briefing regarding the NRS. This set up an opportunity for the Reception Station staff to ask questions, clarify responsibilities, and to develop a better understanding of the purpose and importance of the New Recruit Surveys.

Westat staff set up survey materials, reviewed the lists of incoming recruits, checked the daily schedule of survey administrations, and conducted the daily survey administrations. Typically, uniformed NCO's were available to proctor the survey and to maintain order as recruits completed their survey forms. The introductory comments and survey instructions were structured in advance to ensure completeness and consistency of information in the administrations across the installations. A brief statement concerning the Privacy Act of 1974 was read to each group of recruits prior to their taking the survey. Westat personnel collected the survey materials after each administration and checked off those completing the survey and listed nonrespondents; installation POC's were notified of "no-shows" and were asked to reschedule an administration time for these individuals. Westat staff took responsibility for safely delivering the complete surveys and sample lists back for data preparation.

There were a number of procedures employed in the 1985 NRS administration that could be altered in future surveys to improve survey effectiveness. One such procedure involves the use of government travel orders. Monies for travel to and per diem at the field sites came directly from ARI and was not a part of the

contract funds. This required an enormous amount of coordination between staff at ARI and Westat regarding the scheduling of travel arrangements. Use of travel orders also limited the flexibility that was needed to carry out an extensive field effort, especially in terms of juggling personnel schedules. In order to avoid the problems involved in having one office obtain the orders needed to arrange travel for another group's personnel, and to ensure flexibility for attaining field work goals, it would be best to include travel monies in future NRS budgets.

A second procedure that could be easily altered involves the identification of installation POC's. In some instances, particularly when a civilian had been identified as the sole point of contact, it was apparent that the NRS survey administrator needed access to an additional POC directly involved in the scheduling of in-processing operations. It would seem useful in future NRS administrations to locate a POC within in-processing operations as well as an individual involved with the Reception Station Personnel Affairs or Testing Branch.

Data Preparation

There are two main issues linked to discussions of the data preparation procedures carried out in the 1984 and 1985 NRS. These issues are related to the costs involved in getting the data to machine-readable format and the exercise of control over this process. The 1984 NRS employed optical scan (OPSCAN) answer sheets and the 1985 NRS had respondents provide their answers directly on the questionnaire itself. These two approaches necessitated some differences in the procedures used to translate responses into machine-readable format. The 1984 answer sheets were forwarded to an optical scanning company for processing while the 1985 responses were processed by a coding operation, were keyed onto tape, and then edited using a combination of manual and automated techniques.

There are both positive and negative points that can be made regarding the use of OPSCAN answer sheets. Positive comments relate to cost. Typically, it is less costly to translate survey responses that have been entered on OPSCAN answer sheets to computer tape than it is to use coding and editing operations with key entry. However, there are tradeoffs associated with this cost savings. OPSCAN processing usually means "What the machine sees is what you get." The assumption is made that the form was completed properly and the information obtained is unambiguous. These assumptions may or may not be valid.

On the other hand, a coding and editing operation is much more likely to be able to make interpretations of what respondents' intentions were in cases of erasures, hand-written comments entered in the margins, light (pale) writing, and answers

written with other than a Number 2 pencil than an optical scanning operation. In addition, coders can distinguish between different types of missing or invalid data (e.g., blanks, multiple responses, out-of-range responses, etc.) and are trained to look for unusual and inconsistent response patterns in the data as they code. The tradeoff for coding and editing operations is that they typically cost considerably more than OPSCAN processing.¹

The choice between OPSCAN and coding/editing operations also has an impact on data processing. Coding/editing operations can reduce the number and complexity of subsequent machine editing checks required after the data have been keyed by making corrections before the questionnaires are sent to data entry. This is not normally the case with optical scanning procedures. The processing of the data is entirely in the hands of the optical scanning company and the job is fit into their work schedule.

One additional area of concern in using the OPSCAN method for the NRS concerns the match of methodology to respondent motivation. Typical optical scanning applications record the answers of individuals taking standardized achievement tests such as those required for college and military service applications. In such instances, respondents have high motivation to fill out the answer sheet accurately since the test results will be used to help determine whether or not they will be accepted in college or the Army. However, NRS respondents are being asked to complete a non-mandatory survey in a new and confusing atmosphere. At the Reception Stations the new recruits' days are hectic and heavily scheduled. The NRS administrations often had to be scheduled either at the beginning or end of recruits' days at the processing stations. This set of circumstances may have contributed to low motivation to carefully complete the surveys, particularly one which required the additional effort of recording one's answers on a separate sheet from where the questions were printed. There are some indications (compare the response error rates in the two 1984 and the 1985 User's Manuals, and see Table 1 in the next chapter) that response error rates were reduced with the introduction of the 1985 NRS instruments. Presumably these forms were easier for respondents to complete.

The next chapter of this report will examine the lessons learned in the 1984 and 1985 NRS and will make recommendations that may prove useful in guiding future survey efforts of this sort. Some additional comparisons between the survey formats

¹It is also true that optical scanning companies can also perform many of these functions (including resetting the readers to pick up light marks) but such increased processing drives up the cost and, in the case of resetting the sensitivity of the reader, will likely introduce error.

used in the 1984 and 1985 NRS such as instrument flexibility, data quality and documentation, turnaround time, and cost are drawn in this chapter.

RECOMMENDATIONS FOR FUTURE NRS ADMINISTRATIONS

This chapter presents recommendations for future NRS administrations. The recommendations are a direct outgrowth of lessons learned from the 1984 and 1985 NRS administrations. Three major topic areas are covered in this chapter. They are: (1) the survey instrument, (2) survey administration, and (3) database construction.

The recommendations offered are presented as ways to improve future NRS administrations and insure the collection of high quality survey data. Some recommendations identify areas where ad hoc procedures should be replaced with a more formal implementation while others suggest methods for improving data quality.

The NRS Survey Instrument

The continually changing nature of the recruiting environment makes it necessary to revise NRS questions from time-to-time. This updating of the NRS constitutes one of its strengths. Such revisions allow the NRS to address contemporary conditions and issues. The revision process, however, has not always proceeded smoothly. We offer two recommendations for future NRS revisions:

- The revision process should be formalized. Revisions should be made according to a schedule which is firmly set and monitored.
- The use of separate answer sheets should be discontinued. Recruits should record their responses on the survey instrument.

In addition to these recommendations, a discussion of questionnaire format is presented. Specifically, the tradeoffs involved between adoption of an OPSCAN or more traditional questionnaire format are indicated.

Formalize Questionnaire Revision and Design. During the 1985 NRS, the questionnaire redesign process was not completed until the first week in June. This necessitated rescheduling the first week of administration. Several minor wording problems were discovered with the survey instruments which were fielded in the second week of June 1985. This resulted in a second round of last minute revisions before the final 1985 NRS instruments were printed. Thus, in addition to requiring changes in administration schedules, the late delivery of the survey instrument prevented instrument pretesting which, in turn, caused numerous problems during NRS database construction and necessitated survey item reconciliation.

Future NRS instrument design and revision, including instrument pretesting and revision, should be accomplished in accordance with a strictly monitored timetable. The precise structure of the revision and design process is less important than the establishment of decision making authority regarding revisions and a timetable for decisions. Deadlines for submission of suggested revisions, response to suggestions, and questionnaire construction must be set and followed. Regardless of the actual process used, the final version of the NRS questionnaire should be available no later than one month prior to the first scheduled administration. This allows a reasonable period for the printing, and distribution of questionnaires.

One suggestion that follows from the very extensive data cleaning procedures performed in the 1985 NRS would be to undertake an item analysis before developing any future surveys. The 1985 NRS was very thorough in documenting various types of response errors such as missing data, out-of-range responses, inappropriate multiple responses, and inconsistent responses to related variables, as well as labeling other special missing value codes, i.e., valid skip patterns, non-matches with Army personnel records. Future designers of NRS instruments would be well-advised to examine, in a complete and systematic manner, the validity of survey items before incorporating previously used questions in additional surveys. For example, it is clear that some respondents encountered difficulties in attempting to record the dollar amounts of the government's and their contributions for various educational benefits, as well as enlistment bonus amounts, and so on. Also, some survey items may have posed difficulties for other respondents as demonstrated in the numbers of failed consistency checks, the large number of out-of-range responses, multiple response errors, and/or missing data. Analysis of the configuration of response errors for each survey item in the 1985 NRS would aid in the design of future surveys incorporating questions on similar topics.

Discontinue Use of Separate Answer Sheets. During the 1984 NRS, recruits recorded their answers to survey items on separate answer sheets. It is recommended that this practice be discontinued. Table 1 presents data quality indicators for the two 1984 administrations and the single 1985 administration.

Table 1
Total Response Error Percentages
by NRS Administration*

Number of Errors	Summer 1984 %	Fall/Winter 1984 %	Summer 1985 %
None	3.3	3.6	10.5
10 or More	36.3	40.0	29.0

* Source: Table 12, 1984 User's Manual, Research Note 86-46; Table 11, Supplementary User's Manual for October 84/February 85 Administration, Research Note 86-47; and Table 14, 1985 User's Manual, Research Note 86-50.

Table 1 illustrates dramatic differences in response error percentages associated with response format. In the 1985 NRS recruits recorded their responses directly on the survey instrument rather than on a separate answer sheet as in the 1984 NRS. The percentage of surveys having no response errors nearly tripled in 1985 while the percentage with 10 or more errors is significantly lower than that in 1984.

OPSCAN versus Traditional Survey Format. The recommendations made regarding the NRS survey instrument raise a number of survey design and processing issues that impact upon the NRS. We consider here only those issues related to the operations required for creating a raw (i.e., unedited) survey database. Among the issues that shape survey design and processing are the following:

- Flexibility - are all survey items to be precoded or is it necessary to include open-ended questions?
- Data Quality and Documentation - how fully documented and free from error must survey data be?
- Turnaround Time - how soon following survey administration must the data become available for analysis?
- Cost - what level of effort is the sponsoring agency willing to support?

These issues are obviously interdependent. Nonetheless, in planning an NRS administration, each must be considered. The tradeoffs within each issue will be illustrated using the 1984 and 1985 NRS administrations as examples of fairly standard OPSCAN and traditional survey implementations. The options available for survey format and processing are not restricted to those used in 1984 and 1985, however. Both OPSCAN and traditional survey procedures may be modified to accommodate a variety of features. Accordingly, this subsection will close with a consideration of various hybrid designs that may prove helpful in the future.

How flexible must the instrument be? The 1984 NRS instrument was rather inflexible in the response format offered to recruits. All questionnaire items (excepting date, social security number, etc.) were precoded. One implication of optically scanning such a questionnaire is that any deviation (however valid) from preset response patterns renders the response as out-of-range. This inflexibility, however, translates into a rapid conversion of the survey into a machine-readable form.

By contrast, the 1985 NRS instrument was quite flexible in response format. A mixture of precoded and open-ended questions were asked. Use of open-ended questions allowed the collection of new information not obtainable in OPSCAN format. In addition, respondents were able to record comments and clarifications in the margins of the instrument. As this instrument was manually coded rather than optically scanned, these comments were able to be used in resolving questionable responses (e.g., MOS, parents occupation, education, etc.). The tradeoff here was that the greater amount of information and discretion obtained through the use of a traditional survey format required a greater expenditure of time and effort to translate responses into a machine-readable form. This was especially true when open-ended questions had to be coded.

How completely must survey responses be documented and how free from error must the data file be? The answers to these questions impact greatly on the total survey effort. In 1985 the overriding concerns motivating survey procedures were those of documentation and error reduction. These requirements necessitated the establishment of complex and extensive survey processing procedures (see the 1985 User's Manual, Research Note 86-50). The development and maintenance of survey and item audit trails was costly in terms of both time and personnel effort. It did assure, however, that the survey data base constructed was extensively documented and of exceptionally high quality.

The same cannot be said of the 1984 survey data base. As this administration used an optical scanning answer sheet, data quality is solely a function of the accuracy of responses as

provided by respondents. Because no coding operation was implemented, when the respondent miscoded an answer or somehow started answering out of turn, there was no opportunity for recovering correct responses. Although the quality of the 1984 survey data base could not be documented in the same manner as was possible for the 1985 NRS, the use of OPSCAN considerably reduced the labor required for the construction of a raw (i.e., unedited) survey database. Because audit trails were not established, surveys passed rapidly from collection to database compilation.

How soon following survey administration must data be available for analysis? As we have seen in the discussion of the two issues above, considerable difference existed in the operationalization of the 1984 and 1985 NRS. The 1984 NRS used a standard precoded OPSCAN instrument whereas in 1985 a more traditional survey instrument was used. In addition, 1984 data processing procedures included no manual coding while extensive manual processing was a requirement for the 1985 administration. The implications for turnaround time are obvious. The 1984 OPSCAN survey required only one step (reading of the answer sheets) to progress from responses on an answer sheet to a raw data file. Many more steps were required for the 1985 NRS.

What is the level of effort and expenditure available for the NRS? Instrument design and processing constitute only two factors in the determination of overall survey cost. They are important factors, however. In comparing the 1984 and 1985 administrations, we see that the greatest differences between the two reside in their respective budget categories. Both OPSCAN and traditional surveys require developmental work in the area of instrument development. Regardless of the format adopted, agreement must be reached as to the questions to be asked. It is following this agreement that OPSCAN and traditional surveys diverge. Traditional surveys implement coding and keypunching operations for the translation of survey data into machine-readable form. As discussed above, this can be quite a considerable budgetary item if open-ended coding and audit trails are required. OPSCAN surveys as administered for the 1984 NRS do not require such data handling operations. Instead, they require extensive set-up prior to the reading of answer sheets. Before answer sheets may be read by optical scanning devices, these devices must be programmed to read the correct answer fields. This is not an inconsiderable budget item as initial set-up for a single answer sheet may cost thousands of dollars before the first sheet is read.

These comments have served to characterize the 1984 and 1985 NRS administrations on a number of important issues. The 1984 OPSCAN administration was described as relatively inflexible with regard to the data collected and unable to be fully documented in

the area of data quality. In contrast, the 1985 survey administration utilized a more flexible survey format (including open-ended questions) and was more extensively documented and processed. On the other hand, the potential turnaround time from completed survey to a raw data file was much faster for the OPSCAN administration. Only machine-reading was required in this case whereas the traditional survey implemented extensive coding, keypunching, and audit processing. In the area of cost it became apparent that the major differences between the two administrations resided in the budgetary categories required. OPSCAN as implemented in 1984 required no open-ended or manual consistency coding and so realized a savings in manual processing. Traditional survey processing as accomplished in 1985 did not require the extensive programming set-up necessitated by OPSCAN. In the present comparison, the cost of coding operations in 1985 exceeded the programming set-up costs incurred in the 1984 NRS.

Although these characterizations accurately differentiate between the 1984 and 1985 NRS administrations, they should not be considered as the only options available for either OPSCAN or traditional surveys. Each may be modified in a number of ways to become more responsive to design considerations and the issues raised above. For example, it was noted that OPSCAN surveys are generally relatively inflexible with regard to question response formats. This is not a necessary condition, however. It is possible to include open-ended questions, for example, in an OPSCAN questionnaire. This increase in flexibility, though, is not gained without incurring an attendant cost. While OPSCAN may read precoded responses, open-ended responses will require manual coding much as required for traditional survey formats.

Similar tradeoffs can be made for traditional surveys. Rather than instituting an extensive coding and audit operation, surveys may be only scan-edited for glaring errors. Surveys judged acceptable can then be quickly routed to keypunching and only the few surveys containing the most obvious of errors retained for manual coding. Implementing such a procedure would have the effect of dramatically cutting database turnaround time and placing it approximately on par with an OPSCAN operation. The tradeoff here is that database documentation and quality would diminish in proportion to the amount of processing eliminated.

Obviously, the differences between OPSCAN and traditional formats become minimized as their standard implementations are modified. The initial strengths of OPSCAN surveys (quick turnaround and relatively low processing costs) become less pronounced as additional data collection features (such as open-ended questions) are added to the design. In a similar manner, one of the great strengths of the traditional survey design (control and documentation of the data preparation operation) is reduced as concessions are made (e.g., scan-edits) to speed

turnaround time. Such hybrid designs and processing operations as those noted above offer a number of options for future NRS consideration.

No explicit recommendations are made here regarding the choice between OPSCAN and traditional survey formats. What we have attempted to demonstrate, rather, are issues that must be addressed during the survey design phase of the NRS and their implications for the instrument and its processing. The final decision to adopt one or another particular format is one that must be administration-specific.

NRS Survey Administration

Recommendations presented in this section concern the administration of the NRS. Comparison of 1984 and 1985 NRS procedures has led to the formulation of the following two general recommendations.

- NRS administrative schedules and personnel responsibilities should be clearly established and maintained. Reception Station and research personnel must work together to implement the NRS and monitor its progress.
- Actual administration of the NRS should be supervised by research personnel--not Reception Station personnel. On-site supervision by research personnel is needed to maintain the cooperation of Reception Station personnel and to establish quality controls for survey administration procedures.

Conducting a survey of new recruits at Army Reception Stations is difficult. Reception Stations are highly specialized facilities designed to quickly perform the initial training, inspection, testing, and processing of new recruits into the Army. Normally, it requires three days to complete processing and ship a recruit cohort. Each day begins shortly after 0400 hours and proceeds largely without interruption until lights out shortly after 2000 hours. During the three days available for processing, Reception Station personnel must supervise all recruit activities making certain that schedules and appointments are met. Since new cohorts arrive each working day, at any one time Reception Station personnel are coordinating the processing of three cohorts of new recruits. Obviously, conforming to the schedule is a high priority at Reception Stations. The imposition of any break in timetables (such as NRS administration) is bound to pose some difficulty. The two recommendations discussed below are offered as ways to lessen the disruption an NRS administration can effect at a Reception Station while insuring the collection of complete and accurate data.

Clearly Establish NRS Scheduling and Personnel Responsibilities. It is vitally important to the success of any NRS administration that schedules and personnel responsibilities be clearly established well in advance of actual administration. As a first step in this process, Reception Station commanders should be sent an introductory letter at least six weeks prior to the first NRS administration. The letter should include a brief summary of the purpose of the survey, a clear statement of the survey's utility, and a request for the commander to identify a military point of contact (POC) for research personnel.

Following identification of a POC for the NRS, both the Reception Station commander and the POC should be contacted by research personnel in order to discuss requirements (scheduling, space for survey administration and questionnaire storage, tracking procedures for no-shows, etc.), and the respective responsibilities of Reception Station and research personnel. Since each Reception Station establishes its own scheduling for processing, it is expected that arrangements will vary across Reception Stations. Nonetheless, it is important that they be set and mutually agreed upon. Most likely this will require a series of conversations and letters between station and research personnel.

Once NRS administrations begin, their progress must be monitored. Daily accounting of the number of recruits surveyed as well as no-shows should be produced. Without this information it is impossible to effectively assess the completeness of NRS coverage. The identification and rescheduling procedures adopted for no-shows should be thoroughly discussed prior to survey administration. That is one area where the pressure on Reception Station personnel to process and ship can result in the loss of considerable numbers of new recruits.

NRS Should be Administered by Research Personnel. There is a considerable amount of work associated with the administration of surveys at a Reception Station. Before actual administration, physical requirements must be met (i.e., a room for administration and space for questionnaire storage), recruits must be scheduled, and preparations completed (i.e., assembly of materials and interleaving of survey forms). During the survey, questionnaires must be distributed, instructions given, questions answered, and surveys collected. Following administration, surveys must be inspected for completeness, tallies made of recruits surveyed, no-shows identified, and arrangements made for the shipping of completed questionnaires. Finally, the appropriate personnel must be contacted for the rescheduling of no-shows.

Experience has shown that it is unreasonable to expect Reception Station personnel to accomplish these tasks in addition to their normal responsibilities. Any individual assigned to complete all these tasks would not be available for normal duty

and the use of multiple personnel raises serious coordination problems. Fort Dix provides a good example of the gains realized through the use of on-site research personnel for NRS administration (see the Sample Representativeness discussion in the 1984 User's Manuals, Research Notes 86-46 and 86-47). Table 2 reports the percentage of total NRS surveys contributed by Fort Dix during the 1984 and 1985 administrations.

Table 2
Fort Dix
Percentage Contribution to Total Number of Surveys
Completed by NRS Administration*

Summer 1984 %	Fall/Winter 1984 %	Summer 1985 %
2.4	5.1	17.1

* Source: Table 2, 1984 User's Manual, Research Note 86-46; Table 1, Supplementary User's Manual for October 84/February 85 Administration, Research Note 86-47; and Table 3, 1985 User's Manual, Research Note 86-50.

It is obvious from Table 2 that in 1984 Fort Dix experienced difficulties in administering the NRS using only Reception Station personnel. When research personnel were used for this purpose, however, NRS implementation was considerably more successful (the response rate for Fort Dix in 1985 was .936).

It has been our experience that the use of on-site research personnel enhances the efficiency and quality of NRS administration in four important ways. First, interactions between Reception Station and research personnel foster cooperation. Reception Station personnel are free to question researchers about the NRS--its purpose, procedures, and implications for them. In turn, researchers can discuss implementation with key Reception Station personnel and negotiate a schedule that will disrupt normal operations minimally. This interaction replaces compliance anxiety (What do I have to do? What will happen if too few recruits are surveyed?) with an atmosphere where responsibilities and procedures are known.

Second, the presence of on-site research personnel provides a tangible demonstration of the importance of the NRS. Daily interaction with Reception Station personnel (meetings to discuss

changes in survey scheduling, the identification of no-shows, etc.) assures a high visibility for researchers. This presence underscores the seriousness of the NRS. Realizing this importance, Reception Station personnel responded in a professional manner. Problems (e.g., scheduling mix-ups, no-shows, etc.) became issues to resolve, not barriers.

The use of professional researchers also standardizes survey administration procedures in a way not possible when Reception Station personnel perform this function. Research personnel are trained to use a "script" which assures that introductions, instructions, and responses to questions will be uniform. This ability comes from a thorough understanding of the purpose of the NRS, detailed familiarity with the instrument, and a knowledge of conditions which may affect the validity of responses. Professional survey administrators, then, enhance data quality by providing uniform conditions for recruits.

Finally, the use of on-site research personnel facilitates the documentation of survey implementation. Through active participation in the survey process, researchers are in a position to monitor and document NRS progress. Reception Station personnel are not in this position. Though stations monitor their own performance daily, they are not designed to monitor external (i.e., NRS) production. Having daily contact with a variety of Reception Station personnel, researchers are able to assemble the documentation required for the NRS. The importance of such documentation is demonstrated by the fact that the 1985 administration was the first reporting survey response rate figures.

Summary

New Recruit Surveys (NRS) provide information to Army personnel planners regarding the characteristics, knowledge of enlistment options, and enlistment motivations of new recruits. Methodologies employed in recent years (1984 and 1985) were examined to develop an understanding of the strengths and weaknesses of each. In this way, future efforts can take advantage of the experience of previous NRS administrations.

Based upon the lessons learned, four recommendations are made for the conduct of future surveys:

- The survey instrument revision process should be formalized;
- The use of separate answer sheets should be discontinued;

- NRS administration schedules and personnel responsibilities should be clearly established and maintained; and
- Actual administration of the NRS should be supervised by research personnel, not Reception Station personnel.